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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BERNATZ, KEVIN M

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 09/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,767

Applicant(s)

MAEDA ET AL.

Examiner

Kevin M Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6. 6) ☐ Other: ____

DETAILED ACTION

Response to Amendment

1. Amendments to claims 6 and 8, filed on June 3, 2003, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1, 3, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ando et al. (IEEE Trans. Mag., 33(5), 1997, 2983 – 2985) for the reasons of record as set forth in Paragraph No. 4 of the Office Action mailed on March 3, 2003 (Paper No. 5).
4. Claims 1 – 3, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Futamoto et al. (U.S. Patent Application Publication 2003/0022025 A1) for the reasons of record as set forth in Paragraph No. 5 of the Office Action mailed on March 3, 2003 (Paper No. 5).
5. Claims 1 and 3 - 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawato et al. (U.S. Patent Application 2002/0028356 A1) for the reasons of record

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as set forth in Paragraph No. 6 of the Office Action mailed on March 3, 2003 (Paper No. 5).

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawato et al. as applied above, and further in view of Shimizu et al. (U.S. Patent App. No. 2002/0127433 A1).

Kawato et al. is relied upon as described above.

Kawato et al. fail to disclose a perpendicular magnetic film possessing a thickness not exceeding 5 nm at the maximum.

However, Shimizu et al. teach a magnetic recording medium comprising a substantially identical structure as Kawato et al. (in-plane magnetic/non-magnetic/perpendicular magnetic – see *Shimizu et al.*, *Figure 4*) wherein “the thickness of the perpendicular magnetic layer 4 can be appropriate optimized in view of the desired reproduced output ... and in practice, a thickness on the order of 3 nm to 100 nm is preferable” (*Paragraph 0072*). The Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the perpendicular magnetic layer thickness through routine experimentation, especially given the teaching in Shimizu et al. regarding the desire to optimize the thickness in view of the desired reproduced output. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Geisler*, 116 F. 3d 1465, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Aller*, 220 F.2d, 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Response to Arguments

7. The rejection of claims 1, 3, 6 and 7 under 35 U.S.C § 103(a) – Ando et al.

Applicant(s) argue(s) that the disclosed structure does not read on applicants' claimed structure since applicants' structure "provides that the in-plane magnetic film is formed on the perpendicular magnetic film, without sandwiching a soft magnetic layer". Applicants further argue that the disclosed invention would not meet the claimed tBr relationship and that "the dependency of the perpendicular layer on the thickness as shown in Fig. 4 of the Ando et al. reference is a phenomenon observed only in perpendicular recording media having a two-layered structure without a pinning layer". The examiner respectfully disagrees.

The Examiner notes that applicants' claims are clearly open to additional layers being present between the in-plane magnetic film and perpendicular magnetic film (see claim 4, for example). Since the present claims do not require that the perpendicular magnetic film be "directly deposited" on the in-plane magnetic film, the Ando et al. invention reads on the present claims. The Examiner further notes that attorney arguments are not evidence and that, presently, there is no evidence of record indicating that the disclosed Ando et al. structure does not meet the claimed tBr relationship. Finally, the Examiner notes that Fig. 4 of Ando et al. clearly disclose a structure comprising a pinning layer: "Media: CoCrTa/CoZrNb 600 nm/CoSm 150 nm" where CoSm is the pinning layer, as shown in Figure 1.

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8. The rejection of claims 1 – 3, 6 and 7 under 35 U.S.C § 103(a) – Futamoto et al.

Applicant(s) argue(s) that applicants' structure is different than Futamoto et al. since the "in-plane magnetic film) is never positioned under the perpendicular magnetization film". Applicants further argue that the disclosed invention would not meet the claimed Hk relationship, thereby distinguishing the claimed invention from the Futamoto et al. disclosed invention. The examiner respectfully disagrees.

The examiner notes that the specification is not the measure of the invention. Therefore, limitations contained therein can not be read into the claims for the purpose of avoiding prior art. *In re Sporck*, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1968). Specifically, applicants' claims merely require that the perpendicular magnetic film is formed on said in-plane magnetic film, there are presently no structural limitations regarding which order the films are formed relative to the substrate. As such, the Examiner deems that the limitation "formed on" is met whether the in-plane magnetic film is above or below the perpendicular magnetic film, since the two films are "formed on" each other. Should applicants desire to claim a specific order of the films, applicants are advised to either add additional structure such as the substrate, or to claim the layers "formed in this order". Finally, regarding the relative Hk relationship, the Examiner notes that attorney arguments are not evidence and, presently, there is no evidence of record indicating that the claimed relationship would not be met by the disclosed prior art product.

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9. The rejection of claims 1 and 3 – 7 under 35 U.S.C § 103(a) – Kawato et al.

Applicant(s) argue(s) that the Kawato et al. invention “relates to a perpendicular magnetic recording, whereas the present invention relates to in-plane magnetic recording” and that the Co-based amorphous layer of Kawato et al. would not meet the tBr relationship claimed by applicants. The examiner respectfully disagrees.

The Examiner notes that applicants' claimed invention is directed to “[a] magnetic recording medium” and the limitation “used for recording” is an intended-use limiting which is not further limiting in so far as the structure of the medium is concerned. See MPEP § 2111.02. Regarding the tBr relationship, applicants are reminded that attorney arguments are not evidence and, presently, there is no evidence of record that the Kawato et al. invention would not meet the claimed tBr relationship.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. JP 60-025027-A (JPO Abstract only) teach a combined perpendicular/in-plane magnetic medium wherein the thickness of the perpendicular magnetic layer is required to be less than the in-plane magnetic layer, but no mention of the Br values is given. Yoshikawa et al. (U.S. Patent No. 6,274,233 B1) teach a structure comprising a hard in-plane magnetic film possessing a specific tBr value (*Figure 1 and col. 4, lines 11 – 15*) beneath a perpendicular magnetic film and a non-magnetic spacer film (*Figure 1*), but is silent about the tBr value of the perpendicular magnetic film. Shimizu et al. (U.S. Patent App. No. 2003/0017370 A1) teach that soft

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magnetic in-plane magnetic films for use under perpendicular magnetic films are known to possess high tBr values (*Figure 1 and Paragraphs 0052 – 0058, where $1 \text{ memu/cm}^3 = 800 \text{ G} = 0.08 \text{ T}$*).

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action (see Paragraph 6, above). Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Applicants' amendment resulted in embodiments not previously considered (i.e. an embodiment comprising a combination of the limitation "said perpendicular magnetic film has a thickness not exceeding 5 nm" with the limitation "a nonmagnetic spacer provided between said in-plane magnetic film and said perpendicular magnetic film") which necessitated the new grounds of rejection, and hence the finality of this action.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.



KMB
August 26, 2003



Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700